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DR-468
October 1969

AD

METEOROLOGICAL DATA REPORT

NIKE-HYDAC STV-90
(24 September 1969)

BY

GORDON L. DUNAWAY

ATMOSPHERIC SCIENCES OFFICE
WHITE SANDS MISSILE RANGE, NEW MEXICO

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(24 September 1969)

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Gordon L. Dunaway

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October 1969

DA Task 1T665702D127-02

ATMOSPHERIC SCIENCES OFFICE
WHITE SANDS MISSILE RANGE, NEW MEXICO

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ABSTRACT

Meteorological data gathered for the launching of Nike-Hydac, STV-90 are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

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INTRODUCTION

Nike-Hydac, STV-90, was launched from Launch Complex-33, left boom of L-361, White Sands Missile Range (WSMR), New Mexico, at 1911 hours MDT, 24 September 1969.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Technical Area, U. S. Army Electronics Research and Development Activity, WSMR, New Mexico. Ballistics Meteorologists for this firing were Gordon L. Dunaway and John M. Sharpe.

DISCUSSION

Wind data for the first 216 feet above the surface were obtained from a system composed of five Aerovanes mounted on a 200-foot tower and cabled to component wind indicators.

From 216 to 4,175 feet above the surface, wind data were obtained from T-9 Radar tracked balloon ascents.

Temperature, pressure, and humidity data, along with upper wind data from 4,175 to 71,089 feet above the surface, were obtained from standard rawinsonde observations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by the equal-area method.

Theoretical rocket performance values and wind-weighting values as a function of altitude were provided by the Atmospheric Sciences Office (ASO) and are the basis for the data appearing in Table I.

PAYLOAD	254	Pounds
CORIOIS DISPLACEMENT	WEST 4.0	Miles
SECOND-STAGE IGNITION	TIME 20.0	Seconds
	ALTITUDE 36,025	Feet MSL
PEAK	TIME 223.6	Seconds
	ALTITUDE 643,640	Feet MSL
UNIT WIND EFFECT		
	RANGE 2.20	Miles/MPH
	CROSS 2.30	Miles/MPH
TOWER TILT EFFECT	12.74	Miles/Degree

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES
NIKE-HYDAC STV-90

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
11- 68	.129
68- 108	.065
108- 148	.057
148- 184	.048
184- 216	.028
216- 300	.078
300- 400	.072
400- 600	.095
600- 800	.059
800- 1000	.046

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
1000- 1400	.060
1400- 2000	.057
2000- 2500	.029
2500- 3000	.022
3000- 3500	.008
3500- 4175	.003
4175-11000	-.016
11000-16000	-.011
16000-21000	-.010
21000-26000	-.010

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTORS
26000-32025	-.005
32025-34000	.072
34000-36000	.036
36000-41000	.043
41000-46000	.017
46000-51000	.009
51000-56000	.006
56000-66000	.010
66000-71089	.003

TABLE II. BALLISTIC FACTORS
NIKE-HYDAC STV-90

AERO- VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR													
	1 1645 MDT		2 1715 MDT		3 1745 MDT		4 1755 MDT		5 1805 MDT		6 1815 MDT		7 1825 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1	3.0S	8.0W	4.0S	11.0W	7.0S	8.0W	5.0S	9.0W	3.0S	7.0W	3.0S	4.0W	3.0S	4.0W
2	5.0	8.0	2.0	12.0	4.0	8.0	4.0	11.0	1.0	7.0	3.0	5.0	2.0	5.0
3	5.0	9.0	4.0	16.0	6.0	9.0	5.0	13.0	3.0	8.0	3.0	5.0	3.0	3.0
4	6.0	10.0	3.0	18.0	6.0	12.0	4.0	15.0	2.0	9.0	3.0	4.0	3.0	6.0
5	5.0	10.0	0.0	14.0	5.0	9.0	4.0	11.0	3.0	6.0	1.0	4.0	2.0	4.0

AERO- VANE NO. *	MEAN WIND COMPONENTS IN MILES PER HOUR											
	8 1835 MDT		9 1845 MDT		10 1853 MDT		11 1902 MDT		12 1911 MDT			
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1	3.0S	3.0W	2.0S	2.0W	4.0S	1.5W	5.0S	1.0W	3.0S	1.0W		
2	3.0	4.0	1.0	3.0	5.0	4.0	7.0	3.0	5.0	2.0		
3	3.0	4.0	2.0	3.0	6.0	2.5	6.0	1.0	5.0	1.0		
4	3.0	3.0	1.0	5.0	7.0	5.0	8.0	3.5	7.0	2.0		
5	2.0	5.0	1.0	2.0	5.0	3.0	7.0	2.0	6.0	1.0		

TABLE III. ANEMOMETER WIND SPEED AND DIRECTION
NIKE-HYDAC STV-90

* Heights corresponding to Aerovane Numbers: 1 = 35 Feet 3 = 128 Feet 5 = 200 Feet
2 = 88 Feet 4 = 168 Feet

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	1		2		3		4		5		6	
	1645 MDT		1715 MDT		1745 MDT		1755 MDT		1805 MDT		1815 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216- 300	3.5S	10.0W	0.5N	12.5W	4.0S	8.5W	3.5S	11.5W	2.0S	6.0W	0.0	7.5W
300- 400	3.0	10.5	0.5	10.0	3.0	8.0	1.5	11.0	2.0N	7.0	1.0N	9.0
400- 600	1.0	12.5	1.0S	11.5	4.0	7.5	1.0	11.0	0.0	7.5	0.0	7.5
600- 800	0.5	15.0	2.5N	12.0	5.0	8.5	1.5	13.0	1.0N	6.5	0.5S	8.0
800-1000	2.0N	14.5	2.0	12.5	7.0	5.5	0.0	12.5	0.5S	8.5	2.5	7.5
1000-1400	0.0	15.0	1.5S	11.5	3.5	6.5	1.0N	12.0	0.0	9.0	4.0	8.0
1400-2000	2.5N	13.5	5.5	9.5	4.5	7.5	1.5S	11.5	0.0	7.0	1.0	6.0
2000-2500	3.0	13.5	3.0	10.0	5.0	6.5	1.5N	12.0	2.5N	6.5	1.5N	6.5
2500-3000	1.0	16.5	2.5	10.5	5.5	7.5	1.5	8.5	4.5	8.5	2.0	6.5
3000-3500	2.5	16.5	0.5	10.5	2.5	12.0	3.0	9.0	6.0	8.0	4.0	7.0
3500-4175	4.5	15.0	3.0N	7.0	5.0	11.5	4.5	9.5	7.0	9.5	3.0	10.0

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA
NIKE-HYDAC STV-90

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	7		8		9		10		11		12	
	1825 MDT.		1835 MDT		1845 MDT...		1853 MDT.		1902 MDT		1911 MDT	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
216-- 300	1.5S	4.0W	0.5S	5.0W	0.0	3.5W	5.5S	2.5W	6.0S	2.0W	7.0S	9.0
300-- 400	0.0	4.0	0.5N	6.0	2.0N	5.5	5.0	3.0	5.0	2.0	8.0	1.0E
400-- 600	0.0	5.5	1.0S	5.0	2.5	6.0	4.0	3.5	4.0	3.0	3.5	1.0W
600-- 800	0.5N	5.5	0.5N	5.5	3.0	6.5	3.0	4.0	2.0	4.0	4.0	0.5
800--1000	1.0S	5.5	1.0	6.5	2.5	6.5	2.0	2.5	2.0	3.5	2.0	3.0
1000--1400	2.5	5.5	2.0	6.0	3.0	7.5	0.5N	4.5	0.5	4.0	1.0	3.5
1400--2000	2.0	8.5	1.5	6.5	2.5	6.0	1.5	6.0	2.5N	6.5	1.5N	4.0
2000--2500	1.0	8.0	3.0	6.0	1.5	7.0	1.5	7.0	2.5	7.0	3.5	5.0
2500--3000	0.5	8.5	1.5	6.0	2.0	6.0	1.0	6.0	3.0	7.0	4.0	5.0
3000--3500	1.5N	8.0	1.5	7.0	5.5	6.5	3.5	6.5	3.0	7.5	3.0	5.0
3500--4175	3.5	7.0	3.0	9.0	6.0	6.0	5.0	7.0	3.0	7.5	5.0	5.5

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS					
	1 1545 MDT		2 1912 MDT			
	N-S	E-W	N-S	E-W	N-S	E-W
4175-11000	4.5N	12.0W	8.5N	10.0W		
11000-16000	6.5	7.5	10.0	8.5		
16000-21000	0.0	18.0	5.0	14.0		
21000-26000	5.0N	27.5	10.5	28.0		
26000-32025	7.5	43.5	8.5	47.5		
32025-34000	9.5	53.0	9.0	51.0		
34000-36000	8.5	49.0	8.5	48.5		
36000-41000	7.0	38.5	7.0	39.5		
41000-46000	6.0	34.5	12.5	35.0		
46000-51000	10.0	28.0	17.0	14.0		
51000-56000	0.0	9.0	7.5	13.0		
56000-66000	5.0N	6.0E	8.0N	1.5E		
66000-71089	2.5	8.0	7.5	9.0		

TABLE V. RAWINSONDE-MEASURED WIND DATA
NIXE-HYDAC STV-90

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69
ASCENSION NO. 923

SIGNIFICANT LEVEL DATA
2670020923
WHITE SANDS

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

TABLE VI

PRESSURE GEOMETRIC		TEMPERATURE		REL. HUM.
ALTITUDE	DEGREES	AIR	DEWPOINT	
MILLIBARS MSL FEET		DEGREES	CENTIGRADE	PERCENT
876.0	3989.0	31.0	8.1	24.0
772.0	7627.6	19.1	1.1	30.0
702.7	10273.5	11.5	-0.6	43.0
638.0	12867.4	4.6	-5.2	49.0
626.0	13376.2	5.0	-18.1	17.0
528.0	17875.2	-2.6	-26.5	14.0
476.0	20542.9	-9.5	-32.1	14.0
435.0	22813.5	-13.5	-35.4	14.0
382.0	26017.8	-20.9	-40.8	15.0
354.0	27856.9	-24.1	-42.9	16.0
308.0	31149.0	-31.5	-49.1	16.0
212.0	39479.0	-52.2	0.	-0. **
203.0	40402.6	-52.8	0.	-0. **
141.0	47907.8	-66.7	0.	-0. **
103.0	54088.2	-72.0	0.	-0. **
92.0	56308.5	-67.4	0.	-0. **
78.0	59586.4	-68.0	0.	-0. **
67.0	62643.3	-62.3	0.	-0. **
60.0	64887.4	-63.4	0.	-0. **
57.0	65937.0	-59.8	0.	-0. **
31.0	78751.8	-51.5	0.	-0. **

** RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

UPPER AIR DATA
2670020923
WHITE SANDS
TABLE VII

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69 1545 HRS-MDT
ASCENSION NJ. 923

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	REL.HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
							DIRECTION DEGREES(TN)	SPEED KNOTS	
3989.0	876.0	31.0	8.1	24.0	998.8	680.7	240.0	2.9	1.000267
4000.0	875.7	31.0	8.1	24.0	998.6	680.6	240.0	2.9	1.000267
4500.0	860.6	29.3	7.2	24.8	986.9	678.7	241.7	4.2	1.000262
5000.0	845.8	27.7	6.3	25.7	975.3	676.8	243.4	5.5	1.000257
5500.0	831.2	26.1	5.4	26.5	964.0	674.9	245.1	6.8	1.000253
6000.0	816.9	24.4	4.4	27.3	952.8	673.0	246.7	8.1	1.000248
6500.0	802.8	22.8	3.4	28.1	941.7	671.1	248.4	9.4	1.000244
7000.0	789.0	21.2	2.4	29.0	930.8	669.2	250.1	10.7	1.000239
7500.0	775.4	19.5	1.4	29.8	920.1	667.2	251.6	10.1	1.000235
8000.0	761.7	18.0	1.0	31.8	908.5	665.5	253.1	8.9	1.000232
8500.0	748.2	16.6	0.8	34.3	896.7	663.9	256.3	8.4	1.000229
9000.0	734.9	15.2	0.5	36.7	885.2	662.2	260.2	8.1	1.000226
9500.0	721.8	13.7	0.1	39.2	873.8	660.6	265.7	8.6	1.000223
10000.0	708.9	12.3	-0.4	41.7	862.6	658.9	272.5	9.6	1.000220
10500.0	696.2	10.9	-1.0	43.5	851.3	657.3	281.0	10.8	1.000216
11000.0	683.5	9.6	-1.9	44.7	839.8	655.7	291.7	12.3	1.000212
11500.0	671.0	8.2	-2.7	45.8	828.5	654.1	301.3	13.8	1.000208
12000.0	658.7	6.9	-3.6	47.0	817.3	652.5	304.6	14.8	1.000205
12500.0	646.7	5.6	-4.5	48.2	806.3	650.9	304.3	14.9	1.000201
13000.0	634.9	4.7	-7.6	40.7	794.4	649.7	305.5	12.9	1.000194
13500.0	623.1	4.8	-18.3	16.9	780.4	649.4	307.7	11.2	1.000181
14000.0	611.4	3.9	-19.2	16.6	768.1	648.4	310.5	9.6	1.000178
14500.0	599.9	3.1	-20.2	16.3	756.1	647.4	316.0	9.4	1.000175
15000.0	588.7	2.3	-21.1	15.9	744.2	646.4	317.9	9.6	1.000171
15500.0	577.7	1.4	-22.0	15.6	732.5	645.4	313.2	10.4	1.000168
16000.0	566.8	0.6	-23.0	15.3	721.1	644.4	310.2	11.1	1.000166
16500.0	556.2	-0.3	-23.9	14.9	709.8	643.4	308.4	11.7	1.000163
17000.0	545.8	-1.1	-24.9	14.6	698.6	642.4	307.3	11.2	1.000160
17500.0	535.5	-2.0	-25.8	14.3	687.7	641.4	306.3	10.3	1.000157
18000.0	525.4	-2.9	-26.8	14.0	677.1	640.2	307.6	9.3	1.000154

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69
ASCENSION NO. 923

UPPER AIR DATA
2670020923
WHITE SANDS
TABLE VII (CONT.)

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GRAMS PER CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES (TN)	SPEED KNOTS	
18500.0	515.3	-4.2	-27.8	14.0	667.3	638.7	305.7	8.5	1.000152
19000.0	505.4	-5.5	-28.9	14.0	657.7	637.1	293.2	8.4	1.000149
19500.0	495.7	-6.8	-29.9	14.0	648.2	635.6	284.5	8.9	1.000147
20000.0	486.1	-8.1	-31.0	14.0	638.8	634.0	279.3	9.8	1.000145
20500.0	476.8	-9.4	-32.0	14.0	629.6	632.5	272.4	10.9	1.000143
21000.0	467.4	-10.3	-32.8	14.0	619.4	631.4	267.5	12.3	1.000140
21500.0	458.3	-11.2	-33.5	14.0	609.3	630.3	266.0	14.0	1.000138
22000.0	449.3	-12.1	-34.2	14.0	599.4	629.2	264.2	15.9	1.000135
22500.0	440.4	-12.9	-34.9	14.0	589.6	628.2	263.4	17.8	1.000133
23000.0	431.7	-13.9	-35.7	14.1	580.1	627.0	265.4	19.6	1.000131
23500.0	423.1	-15.1	-36.6	14.2	571.0	625.6	266.9	20.6	1.000129
24000.0	414.6	-16.2	-37.4	14.4	562.1	624.2	267.9	21.0	1.000127
24500.0	406.2	-17.4	-38.2	14.5	553.3	622.8	270.2	21.9	1.000125
25000.0	398.1	-18.5	-39.1	14.7	544.7	621.4	272.8	22.9	1.000123
25500.0	390.1	-19.7	-39.9	14.8	536.2	619.9	274.6	23.9	1.000121
26000.0	382.3	-20.9	-40.8	15.0	527.8	618.5	276.3	25.0	1.000119
26500.0	374.5	-21.7	-41.4	15.3	518.8	617.4	278.0	26.7	1.000117
27000.0	366.8	-22.6	-41.9	15.5	510.0	616.4	279.2	28.2	1.000115
27500.0	359.3	-23.5	-42.5	15.8	501.3	615.3	280.2	29.5	1.000113
28000.0	351.9	-24.4	-43.2	16.0	492.8	614.1	280.8	30.7	1.000111
28500.0	344.5	-25.5	-44.1	16.0	484.7	612.7	281.4	31.8	1.000109
29000.0	337.3	-26.7	-45.0	16.0	476.7	611.3	283.1	33.8	1.000107
29500.0	330.2	-27.8	-46.0	16.0	468.9	610.0	284.5	35.5	1.000105
30000.0	323.3	-28.9	-46.9	16.0	461.2	608.5	285.2	36.6	1.000103
30500.0	316.6	-30.0	-47.9	16.0	453.7	607.1	285.7	37.7	1.000102
31000.0	309.9	-31.2	-48.8	16.0	446.2	605.7	285.6	38.9	1.000100
31500.0	303.2	-32.4	-50.2	15.3**	438.7	604.2	284.6	39.8	1.000098
32000.0	296.5	-33.6	-51.8	14.4**	431.2	602.7	283.0	40.6	1.000096
32500.0	289.9	-34.9	-53.4	13.4**	423.8	601.1	280.8	42.2	1.000095
33000.0	283.5	-36.1	-55.1	12.4**	416.6	599.5	279.4	43.9	1.000093

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
2670020923
WHITE SANDS
TABLE VII (CONT.)

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69 1545 HRS MDT
ASCENSION NO. 923

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GLONOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPFED KNOTS	
33500.0	277.2	-37.3	-56.7	11.5**	409.5	597.9		279.2	45.9	1.000091
34000.0	271.0	-38.6	-58.4	10.5**	402.6	596.4		278.8	47.6	1.000090
34500.0	265.0	-39.8	-60.2	9.6**	395.8	594.8		278.5	49.2	1.000088
35000.0	259.2	-41.1	-62.0	8.6**	389.1	593.2		278.3	50.9	1.000087
35500.0	253.4	-42.3	-63.9	7.6**	382.5	591.6		278.0	52.3	1.000085
36000.0	247.8	-43.6	-65.8	6.7**	376.0	590.0		277.3	53.3	1.000084
36500.0	242.3	-44.8	-67.9	5.7**	369.7	588.4		276.8	54.0	1.000082
37000.0	236.9	-46.0	-70.2	4.8**	363.5	586.8		276.3	54.4	1.000081
37500.0	231.7	-47.3	-72.6	3.8**	357.4	585.2		275.8	53.9	1.000080
38000.0	226.5	-48.5	-75.5	2.8**	351.4	583.6		275.5	52.8	1.000078
38500.0	221.5	-49.8	-79.0	1.9**	345.5	582.0		275.1	51.4	1.000077
39000.0	216.6	-51.0	-84.1	0.9**	339.7	580.3		274.7	49.7	1.000076
39500.0	211.8	-52.2	0.	-0. **	334.0	578.8		274.4	47.1	1.000074
40000.0	206.9	-52.5	0.	-0. **	326.7	578.3		274.2	44.1	1.000073
40500.0	202.0	-53.0	0.	-0. **	319.7	577.8		275.0	42.3	1.000071
41000.0	197.2	-53.9	0.	-0. **	313.4	576.5		276.0	40.6	1.000070
41500.0	192.5	-54.8	0.	-0. **	307.2	575.3		277.3	39.9	1.000068
42000.0	187.8	-55.8	0.	-0. **	301.1	574.1		278.5	39.4	1.000067
42500.0	183.3	-56.7	0.	-0. **	295.1	572.9		279.9	39.9	1.000066
43000.0	178.9	-57.6	0.	-0. **	289.3	571.7		280.9	40.5	1.000064
43500.0	174.7	-58.5	0.	-0. **	283.5	570.4		280.9	41.2	1.000063
44000.0	170.5	-59.5	0.	-0. **	277.9	569.2		281.1	41.6	1.000062
44500.0	166.4	-60.4	0.	-0. **	272.5	568.0		281.7	41.0	1.000061
45000.0	162.4	-61.3	0.	-0. **	267.1	566.7		282.2	40.2	1.000059
45500.0	158.5	-62.2	0.	-0. **	261.8	565.5		282.4	39.2	1.000058
46000.0	154.7	-63.2	0.	-0. **	256.7	564.2		282.6	38.1	1.000057
46500.0	151.0	-64.1	0.	-0. **	251.6	563.0		282.7	36.9	1.000056
47000.0	147.4	-65.0	0.	-0. **	246.7	561.7		282.5	35.9	1.000055
47500.0	143.8	-65.9	0.	-0. **	241.8	560.5		281.5	35.4	1.000054
48000.0	140.3	-66.8	0.	-0. **	236.9	559.4		281.0	35.1	1.000053

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69
ASCENSION NO. 923

UPPER AIR DATA
2670020923
WHITE SANDS
TABLE VII (CONT.)

WSTM SITE COORDINATES
488800.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
48500.0	136.8	-67.2	-0.	231.5	558.8	282.9	35.9	1.000052
49000.0	133.4	-67.6	-0.	226.1	558.2	284.8	35.8	1.000050
49500.0	130.0	-68.1	-0.	220.9	557.6	287.3	35.7	1.000049
50000.0	126.8	-68.5	-0.	215.8	557.0	289.9	35.5	1.000048
50500.0	123.6	-68.9	-0.	210.9	556.5	291.7	34.6	1.000047
51000.0	120.5	-69.4	-0.	206.0	555.9	293.5	33.5	1.000046
51500.0	117.5	-69.8	-0.	201.3	555.3	294.1	31.8	1.000045
52000.0	114.5	-70.2	-0.	196.6	554.7	293.9	29.6	1.000044
52500.0	111.7	-70.6	-0.	192.1	554.1	293.6	27.7	1.000043
53000.0	108.9	-71.1	-0.	187.7	553.5	292.9	26.0	1.000042
53500.0	106.1	-71.5	-0.	183.4	552.9	292.6	24.0	1.000041
54000.0	103.5	-71.9	-0.	179.1	552.4	293.2	21.3	1.000040
54500.0	100.9	-71.1	-0.	174.0	553.4	292.7	19.4	1.000039
55000.0	98.3	-70.1	-0.	168.7	554.8	286.7	15.2	1.000038
55500.0	95.9	-69.1	-0.	163.7	556.2	280.6	12.0	1.000036
56000.0	93.5	-68.0	-0.	158.7	557.7	272.4	10.3	1.000035
56500.0	91.1	-67.4	-0.	154.3	558.5	264.3	8.7	1.000034
57000.0	88.9	-67.5	-0.	150.6	558.4	262.8	9.5	1.000034
57500.0	86.6	-67.6	-0.	146.9	558.2	263.1	11.0	1.000033
58000.0	84.5	-67.7	-0.	143.3	558.1	268.7	12.0	1.000032
58500.0	82.4	-67.8	-0.	139.8	558.0	279.8	12.5	1.000031
59000.0	80.3	-67.9	-0.	136.4	557.9	290.3	12.8	1.000030
59500.0	78.3	-68.0	-0.	133.0	557.7	298.4	12.3	1.000030
60000.0	76.4	-67.2	-0.	129.3	558.8	306.5	11.8	1.000029
60500.0	74.5	-66.3	-0.	125.5	560.0	316.8	10.4	1.000028
61000.0	72.7	-65.4	-0.	121.9	561.3	327.7	8.8	1.000027
61500.0	70.9	-64.4	-0.	118.4	562.5	340.8	7.2	1.000026
62000.0	69.2	-63.5	-0.	115.0	563.8	359.2	5.6	1.000026
62500.0	67.5	-62.6	-0.	111.6	565.0	17.5	4.0	1.000025
63000.0	65.8	-62.5	-0.	108.9	565.2	23.9	3.7	1.000024

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
2670020923
WHITE SANDS
TABLE VII (CONT)

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69 1545 HRS MDT
ASCENSION NO. 923

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
						DIRECTION DEGREES(TN)	SPEED KNOTS	
63500.0	64.2	-62.7	-0.0	106.4	564.8	27.0	3.7	1.000024
64000.0	62.7	-63.0	-0.0	103.9	564.5	30.8	4.3	1.000023
64500.0	61.2	-63.2	-0.0	101.5	564.2	36.1	6.1	1.000023
65000.0	59.7	-63.0	-0.0	98.9	564.4	41.5	8.0	1.000022
65500.0	58.2	-61.3	-0.0	95.8	566.7	38.6	7.8	1.000021
66000.0	56.8	-59.8	-0.0	92.8	568.8	33.7	7.0	1.000021
66500.0	55.5	-59.4	-0.0	90.5	569.2	35.3	6.8	1.000020
67000.0	54.2	-59.1	-0.0	88.2	569.7	45.7	7.1	1.000020
67500.0	52.9	-58.8	-0.0	86.0	570.1	55.7	7.3	1.000019
68000.0	51.7	-58.5	-0.0	83.9	570.5	61.7	5.5	1.000019
68500.0	50.5	-58.1	-0.0	81.8	571.0	67.7	3.8	1.000018
69000.0	49.3	-57.8	-0.0	79.7	571.4	61.1	4.7	1.000018
69500.0	48.1	-57.5	-0.0	77.7	571.8	48.9	6.7	1.000017
70000.0	47.0	-57.2	-0.0	75.8	572.2	38.4	8.0	1.000017
70500.0	45.9	-56.8	-0.0	73.9	572.7	31.2	7.6	1.000016
71000.0	44.8	-56.5	-0.0	72.1	573.1	24.0	7.3	1.000016
71500.0	43.8	-56.2	-0.0	70.3	573.5	26.5	8.3	1.000016
72000.0	42.7	-55.9	-0.0	68.5	574.0	30.0	9.5	1.000015
72500.0	41.7	-55.5	-0.0	66.8	574.4	34.1	10.2	1.000015
73000.0	40.7	-55.2	-0.0	65.1	574.8	39.8	10.0	1.000014
73500.0	39.8	-54.9	-0.0	63.5	575.2	45.5	9.7	1.000014
74000.0	38.9	-54.6	-0.0	61.9	575.7	51.8	10.0	1.000014
74500.0	37.9	-54.3	-0.0	60.4	576.1	58.4	10.7	1.000013
75000.0	37.1	-53.9	-0.0	58.9	576.5	65.0	11.4	1.000013
75500.0	36.2	-53.6	-0.0	57.4	576.9	71.7	11.2	1.000013
76000.0	35.3	-53.3	-0.0	56.0	577.4	78.4	10.8	1.000012
76500.0	34.5	-53.0	-0.0	54.6	577.8			1.000012
77000.0	33.7	-52.6	-0.0	53.2	578.2			1.000012
77500.0	32.9	-52.3	-0.0	51.9	578.6			1.000012
78000.0	32.1	-52.0	-0.0	50.6	579.1			1.000011

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL

24 SEPT. 69

ASCENSION NO. 923

UPPER AIR DATA

2670020923

WHITE SANDS

TABLE VII (CONT.)

WSTM SITE COORDINATES

488580.00 FEET E

185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	WIND DATA		INDEX OF REFRACTION
						DIRECTION DEGREES(TN)	SPEED KNOTS	
78500.0	31.4	-51.7	0.	-0. **	49.4	579.5		1.000011

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69 1545 HRS MDT.
ASCENSION NO. 923

MANDATORY LEVELS
2670020923
WHITE SANDS
TABLE VIII

WSM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

PRESSURE GEOPOTENTIAL		TEMPERATURE		REL. HUM. PERCENT	WIND DATA	
MILLIBARS	FEET	AIR DEGREES	DEWPOINT CENTIGRADE		DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4869.	28.2	6.6	25.	243.0	5.2
800.0	6614.	22.5	3.2	28.	248.8	9.7
750.0	8436.	16.8	0.8	34.	255.9	8.4
700.0	10346.	11.3	-0.8	43.	277.8	10.4
650.0	12358.	5.9	-4.3	48.	304.0	15.3
600.0	14497.	3.1	-20.2	16.	316.1	9.4
550.0	16792.	-0.8	-24.5	15.	307.7	11.5
500.0	19266.	-6.2	-29.5	14.	286.8	8.5
450.0	21937.	-12.0	-34.2	14.	264.3	15.7
400.0	24860.	-18.3	-38.9	15.	272.3	22.7
350.0	28088.	-24.7	-43.4	16.	280.9	31.0
300.0	31708.	-33.0	-51.0	15.**	283.8	40.2
250.0	35828.	-43.1	-65.1	7.**	277.5	53.1
200.0	40636.	-53.4	0.	-0.**	275.4	41.5
175.0	43423.	-58.5	0.	-0.**	280.9	41.3
150.0	46560.	-64.3	0.	-0.**	282.8	36.5
125.0	50173.	-68.7	0.	-0.**	291.0	35.0
100.0	54518.	-70.8	0.	-0.**	290.8	17.4
80.0	58913.	-67.9	0.	-0.**	291.6	12.8
70.0	61567.	-63.9	0.	-0.**	350.0	6.4
60.0	64681.	-63.4	0.	-0.**	40.2	7.5
50.0	68422.	-58.0	0.	-0.**	69.4	3.3
40.0	73068.	-55.0	0.	-0.**	43.5	9.8

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69 1912 HRS MDT
ASCENSION NO. 924

SIGNIFICANT LEVEL DATA

2670020924
WHITE SANDS

TABLE IX

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

PRESSURE GEOMETRIC		TEMPERATURE		REL. HUM.
MILLIBARS	ALTITUDE MSL FEET	AIR DEGREES	DEWPOINT CENTIGRADE	
875.2	3989.0	29.0	8.2	27.0
865.0	4331.1	28.9	7.0	25.0
698.0	10405.7	11.5	-0.3	44.0
642.0	12677.6	5.1	-3.2	55.0
599.0	14522.5	0.1	-5.3	67.0
596.0	14654.8	0.2	-12.5	38.0
590.0	14921.8	1.2	-24.3	13.0
568.0	15925.4	0.9	-27.4	10.0
466.0	21022.6	-12.4	-37.8	10.0
432.0	22919.2	-14.2	-39.3	10.0
354.0	27777.4	-25.7	-41.7	21.0
328.0	29586.4	-28.6	-45.6	18.0
289.0	32605.0	-36.2	-49.6	24.0
221.0	38465.3	-51.1	0.	-0. **
148.0	46774.9	-65.6	0.	-0. **
136.0	48470.3	-65.4	0.	-0. **
121.0	50793.6	-69.2	0.	-0. **
111.0	52485.0	-71.1	0.	-0. **
79.0	59154.9	-69.2	0.	-0. **
75.0	60193.1	-63.7	0.	-0. **
47.0	69760.9	-59.1	0.	-0. **
31.0	78514.1	-52.5	0.	-0. **
23.0	84895.9	-52.3	0.	-0. **
9.3	104841.8	-39.4	0.	-0. **
6.8	111909.7	-41.9	0.	-0. **
5.7	115893.3	-39.7	0.	-0. **

** RELATIVE HUMIDITY NOT SUPPLIED. ZERO VALUE ASSUMED FOR COMPUTATIONS.

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE X

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69 1912 HRS MDT
ASCENSION NO. 924

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
						DIRECTION DEGREES(TN)	SPEED KNOTS	
3989.0	875.2	29.0	27.0	1004.5	678.4	0.	0.	1.000269
4000.0	874.9	29.0	26.9	1004.1	678.4	359.7	0.0	1.000269
4500.0	859.9	28.4	25.5	989.1	677.7	343.8	0.8	1.000262
5000.0	844.8	27.0	27.1	976.5	676.0	327.9	1.6	1.000258
5500.0	830.0	25.6	29.7	964.0	674.4	312.1	2.4	1.000255
6000.0	815.5	24.1	30.2	951.8	672.8	296.2	3.2	1.000251
6500.0	801.2	22.7	31.8	939.7	671.1	299.6	4.1	1.000247
7000.0	787.2	21.3	33.3	927.9	669.5	309.4	5.0	1.000244
7500.0	773.4	19.8	34.9	916.2	667.8	312.1	5.5	1.000240
8000.0	759.9	18.4	36.5	904.6	666.1	313.4	6.1	1.000236
8500.0	746.6	17.0	38.0	893.3	664.4	311.8	6.8	1.000232
9000.0	733.5	15.5	39.6	882.1	662.8	310.4	7.6	1.000228
9500.0	720.7	14.1	41.2	871.1	661.1	309.3	8.7	1.000225
10000.0	708.1	12.7	42.7	860.3	659.4	307.3	9.6	1.000221
10500.0	695.6	11.2	44.5	849.5	657.7	305.2	10.7	1.000217
11000.0	682.9	9.8	46.9	838.2	656.0	303.0	12.3	1.000214
11500.0	670.4	8.4	49.3	827.1	654.4	302.0	13.4	1.000210
12000.0	658.2	7.0	51.7	816.1	652.7	302.0	14.3	1.000207
12500.0	646.2	5.6	54.1	805.4	651.0	300.5	15.7	1.000203
13000.0	634.3	4.2	57.1	794.5	649.4	299.9	16.8	1.000200
13500.0	622.5	2.9	60.3	783.6	647.8	302.0	17.3	1.000197
14000.0	610.9	1.5	63.6	772.8	646.2	303.3	17.3	1.000194
14500.0	599.5	0.2	66.9	762.3	644.6	304.0	17.1	1.000191
15000.0	588.3	1.2	12.8	746.7	643.1	308.6	16.5	1.000171
15500.0	577.2	1.0	11.3	733.2	644.9	313.7	15.8	1.000167
16000.0	566.4	0.7	10.0	720.2	644.5	319.4	14.8	1.000164
16500.0	555.5	-0.6	10.0	709.8	643.0	324.1	13.9	1.000161
17000.0	544.8	-1.9	10.0	699.5	641.4	327.0	13.3	1.000159
17500.0	534.3	-3.2	10.0	689.4	639.8	327.4	12.3	1.000156
18000.0	524.0	-4.5	10.0	679.5	638.3	324.9	10.9	1.000154

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69 1912 HRS MDT
ASCENSION NO. 924

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE X (CONT)

WSTM SITE COORDINATES
4885800.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE				DIRECTION DEGREES (TN)	SPEED KNOTS	
18500.0	514.0	-5.8	-32.6	10.0	669.7	634.7	317.1	9.5	1.000151
19000.0	504.1	-7.1	-33.7	10.0	660.0	635.2	306.5	8.2	1.000149
19500.0	494.4	-8.4	-34.7	10.0	650.5	633.6	299.5	8.1	1.000147
20000.0	484.9	-9.7	-35.7	10.0	641.2	632.0	293.7	8.4	1.000144
20500.0	475.6	-11.0	-36.8	10.0	632.0	630.5	290.6	9.5	1.000142
21000.0	466.4	-12.3	-37.8	10.0	623.0	628.9	288.4	10.9	1.000140
21500.0	457.2	-12.9	-38.2	10.0	611.9	628.3	288.6	13.0	1.000138
22000.0	448.2	-13.3	-38.6	10.0	600.9	627.7	288.0	15.0	1.000135
22500.0	439.3	-13.8	-39.0	10.0	590.1	627.1	286.7	16.8	1.000133
23000.0	430.6	-14.4	-39.2	10.2	579.7	626.4	286.8	18.5	1.000130
23500.0	421.8	-15.6	-39.2	11.3	570.5	625.0	287.5	20.0	1.000128
24000.0	413.3	-16.8	-39.2	12.4	561.5	623.5	290.8	21.1	1.000126
24500.0	404.9	-17.9	-39.3	13.6	552.7	622.1	293.4	22.2	1.000124
25000.0	396.7	-19.1	-39.5	14.7	544.0	620.7	294.9	23.3	1.000122
25500.0	388.6	-20.3	-39.8	15.8	535.4	619.2	295.6	24.3	1.000120
26000.0	380.8	-21.5	-40.1	17.0	527.0	617.8	295.7	25.1	1.000118
26500.0	373.0	-22.7	-40.5	18.1	518.8	616.3	294.2	26.5	1.000117
27000.0	365.5	-23.9	-41.0	19.2	510.7	614.8	292.3	28.0	1.000115
27500.0	358.0	-25.0	-41.4	20.4	502.7	613.4	290.6	29.6	1.000113
28000.0	350.7	-26.1	-42.2	20.6	494.4	612.1	288.9	31.2	1.000111
28500.0	343.4	-26.9	-43.3	19.8	485.7	611.1	288.4	33.1	1.000109
29000.0	336.2	-27.7	-44.3	19.0	477.1	610.1	287.9	35.2	1.000107
29500.0	329.2	-28.5	-45.4	18.1	468.7	609.1	287.3	38.0	1.000105
30000.0	322.2	-29.6	-46.1	18.8	461.0	607.6	286.6	40.8	1.000103
30500.0	315.3	-30.9	-46.7	19.8	453.5	606.1	285.1	42.8	1.000102
31000.0	308.6	-32.2	-47.4	20.8	446.1	604.5	283.6	44.7	1.000100
31500.0	302.0	-33.4	-48.0	21.8	438.9	602.9	281.4	45.5	1.000098
32000.0	295.6	-34.7	-48.7	22.8	431.8	601.3	279.2	46.1	1.000097
32500.0	289.3	-35.9	-49.5	23.8	424.9	599.7	277.0	46.0	1.000095
33000.0	282.9	-37.2	-51.1	22.4**	417.7	598.1	275.3	46.4	1.000093

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
 24 SEPT. 69
 ASCENSION NO. 924
 1912 HRS MDT
 UPPER AIR DATA
 2670020924
 WHITE SANDS
 TABLE X (CONT)
 MSTM SITE COORDINATES
 488580.00 FEET E
 185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
33500.0	276.6	-38.5	-53.0	20.3**	410.6	596.5		274.8	48.2	1.000092
34000.0	270.4	-39.7	-55.0	18.3**	403.6	594.9		274.9	50.3	1.000090
34500.0	264.4	-41.0	-57.0	16.2**	396.8	593.3		275.4	52.5	1.000089
35000.0	258.5	-42.3	-59.2	14.2**	390.1	591.6		274.9	53.4	1.000087
35500.0	252.7	-43.6	-61.4	12.1**	383.5	590.0		274.3	54.0	1.000086
36000.0	247.0	-44.8	-63.9	10.1**	377.0	588.4		273.8	53.9	1.000084
36500.0	241.5	-46.1	-66.5	8.0**	370.6	586.7		273.1	53.9	1.000083
37000.0	236.1	-47.4	-69.6	6.0**	364.4	585.1		272.1	54.1	1.000081
37500.0	230.9	-48.6	-73.4	4.0**	358.3	583.4		271.4	53.7	1.000080
38000.0	225.7	-49.9	-79.0	1.9**	352.3	581.8		271.7	52.0	1.000078
38500.0	220.6	-51.2	0.	-0. **	346.3	580.1		272.1	50.2	1.000077
39000.0	215.4	-52.0	0.	-0. **	339.4	579.0		273.5	47.5	1.000076
39500.0	210.2	-52.9	0.	-0. **	332.6	577.9		275.0	44.8	1.000074
40000.0	205.2	-53.8	0.	-0. **	325.9	576.7		276.7	42.0	1.000073
40500.0	200.3	-54.7	0.	-0. **	319.4	575.6		278.3	39.7	1.000071
41000.0	195.6	-55.5	0.	-0. **	313.1	574.4		276.8	39.9	1.000070
41500.0	190.9	-56.4	0.	-0. **	306.9	573.3		279.2	39.9	1.000068
42000.0	186.3	-57.3	0.	-0. **	300.7	572.1		278.9	39.1	1.000067
42500.0	181.9	-58.1	0.	-0. **	294.8	571.0		278.7	38.4	1.000066
43000.0	177.6	-59.0	0.	-0. **	288.9	569.8		279.8	38.7	1.000064
43500.0	173.3	-59.9	0.	-0. **	283.2	568.6		281.0	39.0	1.000063
44000.0	169.2	-60.8	0.	-0. **	277.6	567.5		281.8	40.2	1.000062
44500.0	165.2	-61.6	0.	-0. **	272.1	566.3		282.6	41.6	1.000061
45000.0	161.2	-62.5	0.	-0. **	266.7	565.1		282.7	41.8	1.000059
45500.0	157.4	-63.4	0.	-0. **	261.4	564.0		282.6	41.8	1.000058
46000.0	153.6	-64.2	0.	-0. **	256.2	562.8		281.9	41.7	1.000057
46500.0	150.0	-65.1	0.	-0. **	251.2	561.6		280.8	41.5	1.000056
47000.0	146.3	-65.6	0.	-0. **	245.6	561.0		282.0	39.7	1.000055
47500.0	142.7	-65.5	0.	-0. **	239.5	561.1		284.4	37.0	1.000053
48000.0	139.2	-65.5	0.	-0. **	233.6	561.2		286.7	35.5	1.000052

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69 1912 HRS PDT
ASCENSION NO. 924

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE X (CONT.)

WSTM SITE COORDINATES
488580.00 FEET E.
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
48500.0	135.8	-65.4	-0.00	227.8	561.2	288.9	35.2	1.000051
49000.0	132.4	-66.3	-0.00	223.0	560.1	291.7	34.4	1.000050
49500.0	129.1	-67.1	-0.00	218.3	559.0	296.1	32.2	1.000049
50000.0	125.9	-67.9	-0.00	213.8	557.8	300.5	29.9	1.000048
50500.0	122.8	-68.7	-0.00	209.3	556.7	300.9	28.8	1.000047
51000.0	119.7	-69.4	-0.00	204.8	555.6	301.2	27.0	1.000046
51500.0	116.7	-70.0	-0.00	200.2	555.0	301.1	26.5	1.000045
52000.0	113.8	-70.6	-0.00	195.7	554.3	300.7	25.0	1.000044
52500.0	110.9	-71.1	-0.00	191.3	553.5	300.8	23.6	1.000043
53000.0	108.1	-71.0	-0.00	186.3	552.7	302.7	22.5	1.000041
53500.0	105.4	-70.0	-0.00	181.5	553.9	304.7	21.4	1.000040
54000.0	102.7	-70.7	-0.00	176.8	554.1	306.2	20.0	1.000039
54500.0	100.2	-70.5	-0.00	172.2	554.3	307.2	18.5	1.000038
55000.0	97.6	-70.4	-0.00	167.8	554.5	308.3	16.9	1.000037
55500.0	95.2	-70.2	-0.00	163.4	554.7	310.2	15.3	1.000036
56000.0	92.8	-70.1	-0.00	159.2	556.9	312.2	13.6	1.000035
56500.0	90.5	-70.0	-0.00	155.1	555.0	312.7	12.1	1.000034
57000.0	88.2	-69.8	-0.00	151.1	555.2	306.4	11.8	1.000033
57500.0	86.0	-69.7	-0.00	147.2	555.4	300.1	11.5	1.000032
58000.0	83.8	-69.5	-0.00	143.4	555.6	300.6	11.2	1.000031
58500.0	81.7	-69.4	-0.00	139.7	555.8	303.1	10.9	1.000030
59000.0	79.6	-69.2	-0.00	136.1	556.0	308.2	10.3	1.000029
59500.0	77.6	-67.4	-0.00	131.5	558.6	315.9	9.3	1.000028
60000.0	75.7	-64.7	-0.00	126.6	562.1	324.0	8.4	1.000027
60500.0	73.9	-63.6	-0.00	122.8	563.7	334.1	7.7	1.000026
61000.0	72.1	-63.3	-0.00	119.7	564.0	344.2	6.9	1.000025
61500.0	70.4	-63.1	-0.00	116.7	564.4	347.8	6.3	1.000024
62000.0	68.7	-62.8	-0.00	113.7	564.7	350.7	5.8	1.000023
62500.0	67.0	-62.6	-0.00	110.9	565.0	355.6	5.9	1.000022
63000.0	65.4	-62.4	-0.00	108.1	565.3	2.1	6.4	1.000021

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE X (CONT.)

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT.69 1912 HRS MDT
ASCENSION NO. 924

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
63500.0	63.8	-62.1	0.	-0. **	105.4	565.7		9.2	6.8	1.000023
64000.0	62.3	-61.9	0.	-0. **	102.7	566.0		18.5	6.8	1.000023
64500.0	60.8	-61.6	0.	-0. **	100.1	566.3		27.8	6.8	1.000022
65000.0	59.3	-61.4	0.	-0. **	97.6	566.6		42.0	6.9	1.000022
65500.0	57.9	-61.1	0.	-0. **	95.1	566.9		56.6	7.0	1.000021
66000.0	56.5	-60.9	0.	-0. **	92.7	567.3		59.8	7.0	1.000021
66500.0	55.1	-60.7	0.	-0. **	90.4	567.6		56.6	7.2	1.000020
67000.0	53.8	-60.4	0.	-0. **	88.1	567.9		53.8	7.2	1.000020
67500.0	52.5	-60.2	0.	-0. **	85.9	568.2		52.0	7.0	1.000019
68000.0	51.2	-59.9	0.	-0. **	83.7	568.6		50.2	6.9	1.000019
68500.0	50.0	-59.7	0.	-0. **	81.6	568.9		47.4	8.2	1.000018
69000.0	48.8	-59.5	0.	-0. **	79.5	569.2		44.6	9.6	1.000018
69500.0	47.6	-59.2	0.	-0. **	77.5	569.5		43.9	9.5	1.000017
70000.0	46.5	-58.9	0.	-0. **	75.6	569.9		44.0	8.7	1.000017
70500.0	45.4	-58.5	0.	-0. **	73.7	570.4		45.5	8.3	1.000016
71000.0	44.3	-58.2	0.	-0. **	71.8	570.9		49.4	8.6	1.000016
71500.0	43.3	-57.8	0.	-0. **	70.0	571.4		53.2	9.0	1.000016
72000.0	42.3	-57.4	0.	-0. **	68.2	571.9		53.9	8.5	1.000015
72500.0	41.3	-57.0	0.	-0. **	66.5	572.4		53.4	7.7	1.000015
73000.0	40.3	-56.7	0.	-0. **	64.8	572.9		53.0	7.0	1.000014
73500.0	39.3	-56.3	0.	-0. **	63.2	573.4		57.9	7.1	1.000014
74000.0	38.4	-55.9	0.	-0. **	61.6	573.9		64.0	7.5	1.000014
74500.0	37.5	-55.5	0.	-0. **	60.1	574.4		70.1	7.8	1.000013
75000.0	36.6	-55.1	0.	-0. **	58.6	574.9		68.1	7.8	1.000013
75500.0	35.8	-54.8	0.	-0. **	57.1	575.4		64.4	7.6	1.000013
76000.0	34.9	-54.4	0.	-0. **	55.6	575.9		60.7	7.5	1.000012
76500.0	34.1	-54.0	0.	-0. **	54.2	576.4		63.3	7.8	1.000012
77000.0	33.3	-53.6	0.	-0. **	52.9	576.9		67.1	8.5	1.000012
77500.0	32.5	-53.3	0.	-0. **	51.5	577.4		80.9	9.0	1.000011
78000.0	31.8	-52.9	0.	-0. **	50.2	577.9		76.0	10.0	1.000011

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69
ASCENSION NO. 924

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE Y (CONT'D)

MSM SITE COORDINATES
48530.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
78500.0	31.0	-52.5	-0.0	49.0	578.4	81.3	11.1	1.000011
79000.0	30.3	-52.5	-0.0	47.8	578.4	88.5	12.2	1.000011
79500.0	29.6	-52.5	-0.0	46.7	578.4	90.7	12.4	1.000010
80000.0	28.9	-52.5	-0.0	45.7	578.5	94.5	12.4	1.000010
80500.0	28.3	-52.4	-0.0	44.6	578.5	98.4	12.4	1.000010
81000.0	27.6	-52.4	-0.0	43.6	578.5	101.3	12.5	1.000010
81500.0	27.0	-52.4	-0.0	42.6	578.5	103.0	12.6	1.000009
82000.0	26.3	-52.4	-0.0	41.6	578.5	106.4	12.8	1.000009
82500.0	25.7	-52.4	-0.0	40.6	578.6	106.0	11.0	1.000009
83000.0	25.1	-52.4	-0.0	39.7	578.6	104.9	8.9	1.000009
83500.0	24.6	-52.3	-0.0	38.7	578.6	103.8	6.7	1.000009
84000.0	24.0	-52.3	-0.0	37.8	578.6	88.3	7.1	1.000008
84500.0	23.4	-52.3	-0.0	37.0	578.6	72.0	7.5	1.000008
85000.0	22.9	-52.2	-0.0	36.1	578.7	57.0	8.0	1.000008
85500.0	22.4	-51.9	-0.0	35.2	579.2	49.3	8.6	1.000008
86000.0	21.9	-51.6	-0.0	34.4	579.6	41.5	9.2	1.000008
86500.0	21.4	-51.3	-0.0	33.6	580.0	35.8	10.0	1.000007
87000.0	20.9	-50.9	-0.0	32.8	580.4	34.4	11.0	1.000007
87500.0	20.4	-50.6	-0.0	32.0	580.9	33.1	12.1	1.000007
88000.0	20.0	-50.3	-0.0	31.2	581.3	32.6	12.8	1.000007
88500.0	19.5	-50.0	-0.0	30.5	581.7	33.2	13.1	1.000007
89000.0	19.1	-49.6	-0.0	29.8	582.1	33.7	13.4	1.000007
89500.0	18.7	-49.3	-0.0	29.0	582.5	35.3	14.0	1.000006
90000.0	18.2	-49.0	-0.0	28.4	583.0	37.5	15.0	1.000006
90500.0	17.8	-48.7	-0.0	27.7	583.4	39.7	15.9	1.000006
91000.0	17.4	-48.4	-0.0	27.0	583.8	44.3	16.9	1.000006
91500.0	17.0	-48.0	-0.0	26.4	584.2	49.9	18.0	1.000006
92000.0	16.7	-47.7	-0.0	25.7	584.6	55.4	19.0	1.000006
92500.0	16.3	-47.4	-0.0	25.1	585.1	60.1	18.9	1.000006
93000.0	15.9	-4.1	-0.0	24.5	585.5	64.6	16.7	1.000005

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE X (CONT)

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69
ASCENSION NO. 924

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION (TN) DEGREES	SPEED KNOTS	INDEX OF REFRACTION
93500.0	15.6	-46.7	0.	-0.	23.9	585.9	69.1	18.4	1.000005
94000.0	15.2	-46.4	0.	-0.	23.4	586.3	72.7	18.4	1.000005
94500.0	14.9	-46.1	0.	-0.	22.8	586.7	76.4	18.5	1.000005
95000.0	14.5	-45.8	0.	-0.	22.3	587.2	79.9	18.5	1.000005
95500.0	14.2	-45.4	0.	-0.	21.7	587.6	82.0	10.4	1.000005
96000.0	13.9	-45.1	0.	-0.	21.2	588.0	84.2	18.4	1.000005
96500.0	13.6	-44.8	0.	-0.	20.7	588.4	86.2	18.3	1.000005
97000.0	13.3	-44.5	0.	-0.	20.2	588.8	80.0	18.1	1.000005
97500.0	13.0	-44.1	0.	-0.	19.7	589.2	89.7	17.9	1.000004
98000.0	12.7	-43.8	0.	-0.	19.3	589.7	90.5	17.4	1.000004
98500.0	12.4	-43.5	0.	-0.	18.8	590.1	90.0	16.4	1.000004
99000.0	12.1	-43.2	0.	-0.	18.4	590.5	89.5	15.4	1.000004
99500.0	11.9	-42.9	0.	-0.	17.9	590.9	90.0	14.3	1.000004
100000.0	11.6	-42.5	0.	-0.	17.5	591.3	92.0	13.0	1.000004
100500.0	11.3	-42.2	0.	-0.	17.1	591.7	93.9	11.7	1.000004
101000.0	11.1	-41.9	0.	-0.	16.7	592.1	95.6	10.4	1.000004
101500.0	10.8	-41.6	0.	-0.	16.3	592.6	94.9	8.9	1.000004
102000.0	10.6	-41.2	0.	-0.	15.9	593.0	94.1	7.5	1.000004
102500.0	10.3	-40.9	0.	-0.	15.5	593.4	93.4	5.1	1.000003
103000.0	10.1	-40.6	0.	-0.	15.1	593.8	90.3	5.6	1.000003
103500.0	9.9	-40.3	0.	-0.	14.8	594.2	86.1	5.7	1.000003
104000.0	9.7	-39.9	0.	-0.	14.4	594.6	81.8	5.7	1.000003
104500.0	9.4	-39.6	0.	-0.	14.1	595.0	77.1	5.8	1.000003
105000.0	9.2	-39.5	0.	-0.	13.8	595.2	70.2	5.7	1.000003
105500.0	9.0	-39.6	0.	-0.	13.5	595.0	63.2	5.7	1.000003
106000.0	8.8	-39.8	0.	-0.	13.2	594.8	56.3	5.6	1.000003
106500.0	8.6	-40.0	0.	-0.	12.9	594.6	59.0	6.1	1.000003
107000.0	8.5	-40.2	0.	-0.	12.6	594.3	66.4	6.9	1.000003
107500.0	8.3	-40.3	0.	-0.	12.4	594.1	73.7	7.7	1.000003
108000.0	8.1	-40.5	0.	-0.	12.1	593.9	81.1	8.4	1.000003

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL
24 SEPT. 69
ASCENSION NO. 924

1912 HRS MDT

UPPER AIR DATA
2670020924
WHITE SANDS
TABLE X (CONT)

WSTM SITE COORDINATES
488580.00 FEET E
185045.00 FEET N

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES CENTIGRADE	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES (TN)	SPEED KNOTS	INDEX OF REFRACTION
108500.0	7.9	-40.7	-0. **	11.9	593.7	88.6	8.3	1.0000003
109000.0	7.7	-40.9	-0. **	11.6	593.4	96.1	8.3	1.0000003
109500.0	7.6	-41.0	-0. **	11.4	593.2	103.7	8.2	1.0000003
110000.0	7.4	-41.2	-0. **	11.1	593.0	108.4	7.9	1.0000002
110500.0	7.2	-41.6	-0. **	10.9	592.8	111.2	7.5	1.0000002
111000.0	7.1	-41.6	-0. **	10.7	592.5	114.0	7.1	1.0000002
111500.0	6.9	-41.8	-0. **	10.4	592.3	116.7	6.7	1.0000002
112000.0	6.8	-41.9	-0. **	10.2	592.2	116.7	5.0	1.0000002
112500.0	6.6	-41.6	-0. **	10.0	592.5	116.7	3.4	1.0000002
113000.0	6.5	-41.3	-0. **	9.7	592.9	115.7	1.3	1.0000002
113500.0	6.3	-41.0	-0. **	9.5	593.2			1.0000002
114000.0	6.2	-40.7	-0. **	9.3	593.6			1.0000002
114500.0	6.1	-40.5	-0. **	9.1	594.0			1.0000002
115000.0	5.9	-40.2	-0. **	8.9	594.3			1.0000002
115500.0	5.8	-39.9	-0. **	8.7	594.7			1.0000002

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.00 FEET MSL

24 SEPT.69

ASCENSION NO. 924

MANDATORY LEVELS

2670020924

WHITE SANDS

TABLE XI

WSTM SITE COORDINATES

488580.00 FEET E

185045.00 FEET N

PRESSURE GEOPOTENTIAL		TEMPERATURE		REL. HUM. PERCENT	WIND DATA	
MILLIBARS	FEET	AIR DEGREES	DEWPOINT CENTIGRADE		DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4839.	27.5	6.6	27.	333.0	1.4
800.0	6583.	22.6	5.1	32.	301.3	4.3
750.0	9408.	17.3	2.8	38.	312.1	6.7
700.0	10322.	11.7	-0.2	44.	306.0	10.3
650.0	12337.	6.0	-2.7	53.	301.0	15.3
600.0	14467.	0.2	-5.3	67.	304.0	17.1
550.0	16757.	-1.3	-29.1	10.	325.7	13.5
500.0	19219.	-7.7	-34.1	10.	302.6	8.0
450.0	21874.	-13.2	-38.5	10.	288.2	14.6
400.0	24791.	-18.6	-39.5	14.	294.4	22.9
350.0	28008.	-26.1	-42.3	21.	288.9	31.4
300.0	31616.	-33.8	-48.3	22.	280.6	45.8
250.0	35719.	-44.2	-62.6	11.**	274.0	53.9
200.0	40504.	-54.7	0.	-0.**	278.4	39.8
175.0	43276.	-59.5	0.	-0.**	280.7	38.9
150.0	46399.	-65.1	0.	-0.**	280.8	41.5
125.0	50028.	-68.1	0.	-0.**	300.7	29.6
100.0	54379.	-70.5	0.	-0.**	307.3	18.4
80.0	58737.	-69.3	0.	-0.**	306.7	10.5
70.0	61407.	-63.0	0.	-0.**	348.3	6.2
60.0	64531.	-61.5	0.	-0.**	34.2	6.8
50.0	68255.	-59.7	0.	-0.**	47.5	8.2
40.0	72863.	-56.5	0.	-0.**	53.2	6.9
30.0	78914.	-52.5	0.	-0.**	88.4	12.4
25.0	82781.	-52.4	0.	-0.**	104.7	8.4
20.0	87530.	-50.3	0.	-0.**	32.5	12.7
15.0	93747.	-46.2	0.	-0.**	74.0	18.4
10.0	102702.	-40.4	0.	-0.**	88.6	5.6
7.0	110680.	-41.7	0.	-0.**	115.6	6.9

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

RELEASE TIME (NOTE)		SECOND-STAGE IMPACT DISPLACEMENT IN MILES DUE TO WIND								AZI- MUTH (DEG- DEGREES)	THEORETICAL IMPACT FROM LAUNCHER (IN MILES)		
		11-216 FT		216-4175 FT		4175-71089 FT		TOTAL					
		N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W				
RAWIN- SONDE	PIBAL	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
1545	1645	3.1S	6.5W	0.5S	15.8W	3.2N	18.8W	0.4S	41.1W	339.3	79.1	74.0N	27.9W
1545	1715	2.2S	10.0W	0.7S	13.6W	3.2N	18.8W	0.3N	42.4W	338.6	80.2	74.7N	29.2W
1545	1745	4.3S	6.7W	5.0S	9.2W	3.2N	18.8W	6.1S	34.7W	342.5	71.6	68.3N	21.5W
1545	1755	3.3S	8.4W	1.0S	14.0W	3.2N	18.8W	1.1S	41.2W	339.1	78.5	73.3N	28.0W
1545	1805	1.8S	5.6W	0.6N	8.9W	3.2N	18.8W	2.0N	33.3W	345.3	79.0	76.4N	20.1W
1545	1815	2.0S	3.3W	0.5S	9.2W	3.2N	18.8W	0.7N	31.3W	346.4	77.3	75.1N	18.1W
1545	1825	2.0S	3.2W	0.9S	6.9W	3.2N	18.8W	0.3N	28.9W	348.1	76.3	74.7N	15.7W
1545	1835	2.1S	2.7W	0.7N	7.0W	3.2N	18.8W	1.8N	28.5W	348.6	77.7	76.2N	15.3W
1545	1845	1.1S	2.1W	2.4N	6.3W	3.2N	18.8W	4.5N	25.1W	351.4	79.8	78.9N	11.9W
1545	1853	3.6S	2.1W	2.7S	4.2W	3.2N	18.8W	3.1S	25.1W	350.5	72.3	71.3N	11.9W
1545	1902	4.4S	1.4W	2.5S	4.7W	3.2N	18.8W	3.7S	24.9W	350.6	71.7	70.7N	11.7W
1912*	1911*	3.3S	1.0W	3.4S	2.2W	3.4N	18.4W	3.3S	21.6W	353.2	71.6	71.1N	8.4W

AZI- MUTH (DEG- REES)	MILES FROM LAUNCHER		
	RANGE	N-S	E-W
LAUNCHER SETTING (ELEVATION 84.0 DEGREES QE)	76.4	74.4N	17.2E
NO WIND IMPACT	75.6	74.4N	13.2E
PREDICTED SECOND-STAGE IMPACT	70.0	69.5N	8.5W
SECOND-STAGE IMPACT, RADAR TRACK	76.0	75.4N	9.4W
PREDICTED BOOSTER IMPACT	1.1	0.8N	0.8E
ACTUAL BOOSTER IMPACT	N/A	N/A	N/A

TABLE XII. IMPACT PREDICTION DATA
NIKE-HYDAC STV-90

* POST-SHOOT DATA

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13. ABSTRACT			
<p>Meteorological data gathered for the launching of Nike-Hydac, STV-90 are presented for the Space and Missile Systems Organization, AFMDC, Holloman Air Force Base, New Mexico, and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form. ()</p>			

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